**Honors Algebra 2 Midterm REVIEW PACKET Name:\_\_\_\_\_\_\_\_\_\_\_**

**Solve the system.**

1. 

2. 

**Solve the equation. Check your solution(s).**

3. 

4. 

5. 

**Factor the polynomial completely.**

6. 

7. 

8. 

**Divide using polynomial long division.**

9. 

10. 

**Decide whether the function is a polynomial function. If so, write it in standard form and state its degree, type, and leading coefficient.**

11. 

**Solve the system.**

12. 

**Write a rule for *g* described by the transformations of the graph of *f*. Then identify the vertex.**

13. ; horizontal shrink by a factor of  and a translation 2 units down, followed by a reflection in the *x*-axis.

**Find the product.**

14. 

15. 

**Write the expression in simplest form. Assume all variables are positive.**

16. 

**Graph the function. Label the vertex and axis of symmetry.**

17. 

18. Find the indicated real *n*th root(s) of *a*.

, 

**Graph the system of quadratic inequalities.**

 19. 

**Find all zeros of the polynomial function.**

20. 

**Graph the function and its parent function. Then describe the transformation.**



21. 

**Write the expression in simplest form.**

22. 

23. 

**Write a polynomial function *f* of least degree that has a leading coefficient of 1 and the given zeros.**

24. 

**Write an equation of the parabola shown.**

25. 

26. 

**Solve the equation.**

27. 

28. 

29. 

30. 

31. 

32. 

**Find the minimum or maximum value of the function. Describe the domain and range of the function, and where the function is increasing and decreasing.**

 33. 

**Simplify the expression.**

34. 

**Describe the end behavior of the graph of the function.**

35. 

**Determine whether the function is *even*, *odd*,or *neither*.**

36. 

**Write an equation of the parabola in intercept form.**

37. *x*-intercepts of –2 and –6; passes through 

**Graph the polynomial function.**

38. 

**Find the zero(s) of the function.**

39. 

40. 

41. Use the *linear regression* feature on a graphing calculator to find the line of best fit for the data in the table. Estimate the height (in centimeters) of a person whose femur is 38 centimeters long.

|  |  |
| --- | --- |
| **Femur length (centimeters), *x*** | **Height (centimeters), *y*** |
| 39 | 171 |
| 44 | 184 |
| 31 | 152 |
| 49 | 196 |
| 36 | 163 |
| 40 | 175 |
| 29 | 142 |
| 33 | 152 |
| 46 | 186 |
| 44 | 183 |

**Write a function *g* whose graph represents the indicated transformation of the graph of *f.***

42. 

**Divide using synthetic division.**

43. 

44. 

**Find the real solution(s) of the equation. Round your answer to two decimal places when appropriate.**

45. 

**Perform the operation. Write the answer in standard form.**

46. 

47. 

**Describe the transformation of  represented by *g*. Then graph each function.**

48. 

**Find the sum.**

49. 

**Find all real solutions of the equation.**

50. 

**Write a cubic function whose graph passes through the given points.**

51. 

**Evaluate the expression using a calculator. Round your answer to two decimal places when appropriate.**

52. 

OPEN-ENDED QUESTIONS COME FROM:

Page 137 numbers 27-34 Page 202 numbers 9-16

Page 100 numbers 27-34 Page 217 numbers 23-30

Page 184 numbers 23-30

**Honors Algebra 2 Midterm Assessment REVIEW 20152016**

**Answer Section**

1. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.5

NAT: HSA-CED.A.3 | HSA-REI.C.7

KEY: solving systems of nonlinear equations by substitution | system of nonlinear equations | solving systems of nonlinear equations NOT: Example 2

2. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.5

NAT: HSA-CED.A.3 | HSA-REI.C.7

KEY: solving systems of nonlinear equations by substitution | system of nonlinear equations | solving systems of nonlinear equations NOT: Example 4

3. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.4

NAT: HSA-REI.A.1 | HSA-REI.A.2

KEY: radical equation | solving radical equations | extraneous solutions

NOT: Example 3

4. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.4

NAT: HSA-REI.A.1 | HSA-REI.A.2 KEY: radical equation | solving radical equations

NOT: Example 1

5. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.4

NAT: HSA-REI.A.1 | HSA-REI.A.2 KEY: radical equation | solving radical equations

NOT: Example 1

6. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.4

NAT: HSA-SSE.A.2 KEY: factoring polynomials | factored completely | polynomial

NOT: Example 3

7. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.4

NAT: HSA-SSE.A.2 KEY: factoring polynomials | factored completely | polynomial

NOT: Example 1

8. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.4

NAT: HSA-SSE.A.2 KEY: factoring polynomials | factored completely | polynomial

NOT: Example 1

9. ANS:

no; 

PTS: 1 DIF: Level 2 REF: Algebra 2 Sec. 5.6

NAT: HSA-CED.A.4 | HSF-BF.B.4a KEY: inverse functions | finding inverses of nonlinear functions

NOT: Example 4

10. ANS:

 

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.3

NAT: HSA-APR.D.6 KEY: dividing polynomials | polynomial

NOT: Example 1

11. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.3

NAT: HSA-APR.D.6 KEY: dividing polynomials | polynomial

NOT: Example 1

12. ANS:

polynomial function; ; 4 (quartic), leading coefficient: –4

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.1

NAT: HSF-IF.B.4

KEY: identifying polynomial functions | polynomial function | polynomial | standard form of a polynomial | degree of a polynomial | leading coefficient NOT: Example 1

13. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 1.4

NAT: HSA-REI.C.6

KEY: system of three linear equations | solution of a system of three linear equations | linear equation in three variables | one solution NOT: Example 1

14. ANS:

; 

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 2.1

NAT: HSF-BF.B.3 KEY: quadratic function | parabola | vertex of a parabola | vertex form

NOT: Example 4

15. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.2

NAT: HSA-APR.A.1 | HSA-APR.C.4 KEY: special product patterns | polynomial

NOT: Example 6

16. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.2

NAT: HSA-APR.A.1 | HSA-APR.C.4 KEY: multiplying polynomials | polynomial

NOT: Example 3

17. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.2

NAT: HSN-RN.A.2 KEY: simplifying variable expressions

NOT: Example 7

18. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 2.2

NAT: HSF-IF.B.4 | HSF-IF.C.7c | HSA-APR.B.3

KEY: axis of symmetry | quadratic function | parabola | vertex of a parabola | vertex form

NOT: Example 1

19. ANS:

3

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.1

NAT: HSN-RN.A.1 | HSN-RN.A.2 KEY: nth root of a | finding nth roots

NOT: Example 1

20. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.6

NAT: HSA-CED.A.1 | HSA-CED.A.3

KEY: graphing systems of quadratic inequalities | quadratic inequality in two variables | system of quadratic inequalities NOT: Example 3

21. ANS:





PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.6

NAT: HSA-CED.A.4 | HSF-BF.B.4a KEY: inverse functions | finding inverses of linear functions

NOT: Example 2

22. ANS:





PTS: 1 DIF: Level 2 REF: Algebra 2 Sec. 5.6

NAT: HSA-CED.A.4 | HSF-BF.B.4a KEY: inverse functions | finding inverses of nonlinear functions

NOT: Example 3

23. ANS:

–2, 1, 

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.6

NAT: HSN-CN.C.9 | HSA-APR.B.3

KEY: polynomial function | finding zeros of polynomial functions | zero of a function

NOT: Example 2

24. ANS:

The graph of *g* is a translation 3 units

left, a vertical stretch, a reflection in the -axis, and a translation 2 units up of the parent absolute value function.

PTS: 1 DIF: Level 2 REF: Algebra 2 Sec. 1.1

NAT: HSF-BF.B.3

KEY: graphing functions and parent functions | describing transformations | parent function | combinations of transformations NOT: Example 5

25. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.2

NAT: HSN-RN.A.2

KEY: properties of radicals | writing radical expressions in simplest form | simplest form of a radical

NOT: Example 3

26. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.2

NAT: HSN-RN.A.2 KEY: writing radical expressions in simplest form

NOT: Example 4

27. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.5

NAT: HSA-APR.B.3

KEY: writing polynomial functions | polynomial function | zero of a function

NOT: Example 5

28. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 2.3

NAT: HSF-IF.B.4 | HSG-GPE.A.2 KEY: focus | parabola | vertex of a parabola | axis of symmetry

NOT: Example 4

29. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 2.3

NAT: HSF-IF.B.4 | HSG-GPE.A.2 KEY: focus | directrix | parabola | vertex of a parabola

NOT: Example 3

30. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.3

NAT: HSN-CN.C.7 | HSA-REI.B.4b

KEY: solving quadratic equations by completing the square | quadratic equation | solving quadratic equations NOT: Example 3

31. ANS:

, and 

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.5

NAT: HSA-APR.B.3 KEY: solving polynomial equations | polynomial equation

NOT: Example 1

32. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.1

NAT: HSA-SSE.A.2 | HSA-REI.B.4b

KEY: solving quadratic equations using square roots | solving quadratic equations | quadratic equation in one variable NOT: Example 2

33. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.1

NAT: HSA-SSE.A.2

KEY: solving quadratic equations by graphing | solving quadratic equations | quadratic equation in one variable NOT: Example 1

34. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.1

NAT: HSA-SSE.A.2 | HSA-REI.B.4b

KEY: solving quadratic equations using square roots | solving quadratic equations | quadratic equation in one variable NOT: Example 2

35. ANS:

 and 

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.5

NAT: HSA-APR.B.3 KEY: solving polynomial equations | polynomial equation

NOT: Example 1

36. ANS:

The maximum value is –3.5. The domain is all real numbers and the range is . The function is increasing to the left of  and decreasing to the right of .

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 2.2

NAT: HSF-IF.B.4 | HSF-IF.C.9

KEY: axis of symmetry | standard form | minimum value | maximum value | quadratic function | parabola | vertex of a parabola | domain | range | increasing function | decreasing function

NOT: Example 3

37. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.2

NAT: HSN-RN.A.2 KEY: simplifying variable expressions

NOT: Example 6

38. ANS:

 as  and  as 

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.1

NAT: HSF-IF.B.4 KEY: end behavior | polynomial function | polynomial

NOT: Example 3

39. ANS:

odd

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.8

NAT: HSF-BF.B.3 KEY: even function | odd function NOT: Example 4

40. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 2.4

NAT: HSA-CED.A.2 | HSF-IF.B.6 | HSF-BF.A.1a

KEY: quadratic function | parabola | writing quadratic functions | x-intercept | intercept form |

NOT: Example 2

41. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.1

NAT: HSF-IF.B.4 | HSF-IF.C.7c

KEY: graphing polynomial functions | polynomial function | polynomial | graph of a polynomial function | sketching graphs of polynomial functions NOT: Example 4

42. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.1

NAT: HSA-SSE.A.2 | HSA-REI.B.4b | HSF-IF.C.8a

KEY: finding zero(s) of quadratic functions | quadratic function |zero of a function | quadratic equation in one variable NOT: Example 4

43. ANS:



PTS: 1 DIF: Level 2 REF: Algebra 2 Sec. 3.2

NAT: HSN-CN.A.1 | HSN-CN.C.7 | HSA-REI.B.4b

KEY: finding zero(s) of quadratic functions | complex solutions and zeros | quadratic function

NOT: Example 7

44. ANS:

; about 167.4 centimeters

3

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 1.3

NAT: HSA-CED.A.2 | HSF-IF.C.9 | HSF-BF.A.1a | HSF-LE.A.2 | HSS-ID.B.6a

KEY: application | linear regression | line of best fit | finding lines of best fit

NOT: Example 4

45. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 1.2

NAT: HSF-BF.B.3 KEY: writing functions representing transformations | transformation

NOT: Example 3

46. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.3

NAT: HSA-APR.D.6 KEY: dividing polynomials | polynomial | synthetic division

NOT: Examples 2 and 3

47. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.3

NAT: HSA-APR.D.6 KEY: dividing polynomials | polynomial | synthetic division

NOT: Examples 2 and 3

48. ANS:

 

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.1

NAT: HSN-RN.A.1 | HSN-RN.A.2 KEY: solving equations using nth roots

NOT: Example 4

49. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.2

NAT: HSN-CN.A.1 | HSN-CN.A.2 KEY: adding or subtracting complex numbers

NOT: Example 3

50. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 3.2

NAT: HSN-CN.A.1 | HSN-CN.A.2 KEY: multiplying complex numbers

NOT: Example 5

51. ANS:

The graph of *g* is a translation 1 unit left of the graph of *f*.



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 2.1

NAT: HSF-IF.C.7c | HSF-BF.B.3 KEY: quadratic function | parabola

NOT: Example 1

52. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.2

NAT: HSA-APR.A.1 KEY: adding polynomials | polynomial

NOT: Example 1

53. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.5

NAT: HSA-APR.B.3 KEY: solving polynomial equations | polynomial equation

NOT: Example 3

54. ANS:



PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 4.9

NAT: HSA-CED.A.2 | HSF-BF.A.1a

KEY: writing polynomial functions for sets of points | writing polynomial functions | graph of a polynomial function | polynomial function NOT: Example 1

55. ANS:

6

PTS: 1 DIF: Level 1 REF: Algebra 2 Sec. 5.1

NAT: HSN-RN.A.1 | HSN-RN.A.2 KEY: approximating expressions with rational exponents

NOT: Example 3